










Psychological predictors of 'living well' with dementia: findings from the IDEAL study

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ABSTRACT

Objectives: Increasingly, research has explored how psychological resources enable adaptation to illness. However, it is unclear whether psychological resources protect against the potential negative effects on living well with a progressive and life-limiting condition such as dementia. This paper examines the association between psychological resources and the ability to 'live well' with dementia.

Method: Data from 1547 people with mild-to-moderate dementia in the Improving the experience of Dementia and Enhancing Active Life (IDEAL) cohort were used. Multivariate linear regression was employed to examine the association between self-reported measures of psychological resources (self-efficacy, optimism and self-esteem) and indices of capability to 'live well' (quality of life, well-being and life satisfaction).

Results: All three measures of psychological resources had positive and independent associations with indices of living well and the effect sizes were similar. Effect sizes reduced when accounting for shared variance between psychological resources, showing some overlap in these constructs.

Conclusion: Self-efficacy, optimism and self-esteem were each associated with capability to 'live well'. Overlap between these three resources is evident and when combined they may provide greater resilience when dealing with the challenges of living with dementia. Interventions for people with dementia could seek to improve levels of these potentially-modifiable psychological resources.

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Background and objectives

The Institute of Medicine defines 'living well' with chronic illness and disability as 'the best achievable state of health that encompasses all dimensions of physical, mental and social well-being' (Institute of Medicine, 2012, p.32). Experiences of living well are reflected in subjective reports of quality of life, well-being and life satisfaction, whether self-rated or rated by others (Clare, Nelis, et al., 2014). Although these indices of living well are likely to decline as chronic illness progresses, the experience of dementia should be viewed as an interplay between limitations arising from neurological impairment on the one hand, and the external environment and individual psychological characteristics on the other (Kitwood & Bredin, 1992). Impairment arising from dementia will affect an individual's experience, but external influences such as the availability of formal and informal care will contribute to how an individual copes with increasing impairment. Further, the way individuals think and feel about their situation (positive psychological resources) may also determine how increasing impairment is interpreted and dealt with, and how people respond to available social and financial support (Hobfoll, 2002). In the case of progressive and life-limiting health conditions such as dementia, where disease

outcomes cannot be altered, psychological resources may be particularly important in helping people cope.

Through observation of the physical and verbal expressions of people with dementia, Kitwood and Bredin (1992) derived a list of indicators of well-being. They concluded that these indicators reflect a number of overarching states important for well-being, including self-esteem (a global sense of self-worth), a sense of agency or control in one's life, social confidence (being able to interact with others) and 'hope' reflecting a positive outlook that the future will be 'good'. More recently, Wolverson, Clarke and Moniz-Cook (2016) compiled previous qualitative research that illuminated the existence and nature of positive experiences of those living with dementia. Accounts of positive experience were grouped into three overlapping themes: 'engaging with life in ageing', whereby people with dementia may seek continued engagement, enjoyment and social support; 'engaging with dementia', which as a continuation of engaging with life is about making conscious efforts to live well despite a diagnosis, and using humor and positive thinking to cope with a diagnosis; and 'identity and growth', whereby people maintain a positive identity through positive life review, acknowledging their continued sense of self and meaning that has arisen from having a diagnosis of dementia. This qualitative literature

reinforces the idea that people with dementia can have positive lived experiences and display a number of varied positive psychological resources. However, diminishing cognitive functioning and an assumed 'loss of the self' among those with dementia may help to explain the lack of research exploring further the association between psychological resources and ability to live well and how resources can be promoted among people living with dementia.

Within the quantitative literature, high self-efficacy (sometimes termed mastery or control), optimism and self-esteem are repeatedly implicated as important psychological resources for living well among various groups experiencing illness or stressors (e.g. Aspinwall & Taylor, 1992; Cozzarelli, 1993; Hobfoll, 2002; Lee, Cohen, Edgar, Laizner, & Gagnon, 2006; Rini, Dunkel-Schetter, Wadhwa, & Sandman, 1999; Sandler, 2001; Taylor, 1983; Taylor & Brown, 1988; Teoh, Sims, & Milgrom, 2009). However, a meta-analysis of 198 studies examining factors that predict quality of life among people with dementia did not find sufficient studies examining self-efficacy, optimism and self-esteem to permit their inclusion as predictors within the meta-analysis (Martyr et al., 2018). Acknowledging the personhood of people with dementia, the current study examines whether there is a relationship between these psychological resources and living well among people with dementia. These three psychological resources do not necessarily encompass the whole range of positive psychological experience, but instead represent three resources that are commonly known to be beneficial among other groups facing illness or stressors, are understudied among those with dementia and may be amenable to intervention to support living well.

The conviction that one can successfully execute the behavior required to produce the outcomes' is termed *self-efficacy* (Bandura, 1977, p193). *General self-efficacy* is measured in settings where self-efficacy is not being viewed as specific to a given situation, as is the case with 'living well' (Luszczynska, Scholz & Schwarzer, 2005). Bandura (1977) outlined how perceived self-efficacy is a determinant of persistence and pursuit of success, but also of the activities people engage in to start with. Self-efficacy may therefore impact levels of activity engagement and success in activities that can influence the ability to 'live well' among people with dementia. Blascovich and Tomaka (1991; p 115) define *self-esteem* as 'the sum of evaluations across salient attributes of one's self or personality. It is the overall affective evaluation of one's own worth, value, or importance'. Self-esteem and quality of life are also commonly viewed as related, as the view of one's life will be affected by the view of the self. In fact, self-esteem is often considered as an indicator, or one dimension, of quality of life (see Ettema et al., 2005 for a summary). Finally, *optimism* is a trait characterized by a disposition to expect positive outcomes in the face of adversity and hardship. Optimism is thought to influence motivation, in that people who express more optimism exert more effort and work harder at social relations, and this may positively impact on living well (Carver & Scheier, 2014).

Psychological resources—self-efficacy, optimism and self-esteem—may directly and indirectly impact on living well. Directly, psychological resources may alter subjective appraisals of life circumstances. Indirectly, psychological

resources may determine motivation and behaviors, thereby altering aspects of day-to-day living and the potential for 'living well' (Bandura, 1977; Carver & Scheier, 2014; Steptoe, Wright, Kunz-Ebrecht, & Iliffe, 2006). However, there is only minimal research examining the association between self-esteem and self-efficacy and living well outcomes such as quality of life (Dawson, Powers, Krestar, Yarry, & Judge, 2013; Moyle, McAllister, Venturato & Adams, 2007; Young, Ng, & Kwok, 2017), and we found no evidence for optimism. A psychological resource very similar to optimism however—*hope*—has previously been linked to better quality of life (Stoner, Orrell, & Spector, 2018).

When examining the role of psychological resources, there are two further points of interest: the impact dementia itself has on psychological resources and the extent to which positive psychological resources can be distinguished as distinct constructs, as opposed to representing a global construct of 'resilience'. The progressive deterioration that characterizes dementia may impact negatively on self-efficacy, optimism and self-esteem, both through personal experiences of reduced abilities and through vicarious experiences such as seeing others with dementia or accessing information on dementia (Bandura, 1977; Sabat, Fath, Moghaddam, & Harré, 1999). Burgener and Berger (2008) found lower levels of self-esteem and sense of personal control among people in the mild-to-moderate disease stages of Alzheimer's disease when compared to people with Parkinson's disease. The authors suggest that this may be due to disease processes in the early to middle stages of Alzheimer's disease affecting different aspects of cognitive and physical functioning, compared to Parkinson's disease. The current study includes those with Alzheimer's disease, but also other sub-types of dementia such as Parkinson's disease dementia and dementia with Lewy bodies, therefore it is important to take differences in physical and cognitive deterioration into account when examining positive psychological resources among people with dementia.

All three psychological resources represent positive frameworks of thinking, and so they are sometimes brought together as a global construct under the heading of 'resilience' (e.g. Connor & Davidson, 2003; Liu, Wang, Zhou, & Li, 2014). Resilience has been discussed as a positive personality trait characterized by better psychological adjustment in response to accumulating challenge (Liu, Wang, Zhou, & Li, 2014). Psychological resources such as self-efficacy, optimism and self-esteem are commonly measured as part of the assessment of resilience, along with other psychological resources, such as viewing change as challenge, hardiness and active coping (Connor & Davidson, 2003; Rutter, 1985). We would expect a positive association between self-efficacy, optimism and self-esteem, therefore, but within this study we consider them as theoretically distinct psychological resources and we would expect each to make a unique contribution to living well with dementia.

The current study examines the association between psychological resources and living well among people with dementia. Both the measures of psychological resources and the indicators of living well are more comprehensive than previously used and the study benefits from a large community-based sample of people living with dementia.

This allows us to assess the importance of optimism for the first time and more robustly look at self-efficacy and self-esteem. It examines whether higher levels of the three psychological resources are associated with higher scores for life satisfaction, well-being and quality of life, while accounting for differences in cognitive and functional impairments, dementia subtype, gender and age. Building on this, the overlap between these psychological resources is examined, with the expectation that psychological resources will be positively related but remain independent predictors of scores on measures of 'living well'.

Method

Design and sample

Data from the first time-point of the Improving the experience of Dementia and Enhancing Active Life (IDEAL) project were analyzed. The IDEAL study is a longitudinal cohort study of people with dementia and carers. Details of the aims and procedures of the study can be found in the published protocol (Clare, Nelis, et al., 2014; Silarova et al., 2018). The 1547 participants with dementia were recruited from 29 research sites across England, Scotland and Wales; in most cases a caregiver also participated, and the sample comprised 1283 informal caregivers, mainly spouses or other family members. Only data from the participants with dementia are analyzed in this paper. Researchers interviewed participants in their own homes, assessing resources, challenges and coping, as well as quality of life, well-being and life satisfaction. To be included in the study, participants had to have a clinical diagnosis of any dementia subtype (World Health Organization, 1992), to be in the mild-to-moderate stages of dementia (Mini-Mental State Examination score of 15 or above; Folstein, Folstein, & McHugh, 1975) and to reside within their own home (rather than in residential or nursing homes) at baseline. Participants were excluded if they had a co-morbid terminal illness, inability to speak English, posed a danger to researchers or were unable to provide informed consent. The IDEAL study gained approval from the Wales 5 National Health Service Research Ethics Committee (reference: 13/WA/0405) and the Ethics Committee of the School of Psychology, Bangor University (reference 2014 – 11684), and is registered with UKCRN (registration number 16593).

Measures

Measures of psychological resources

The General Self-Efficacy Scale (GSES; Schwarzer & Jerusalem, 1995) was used (Cronbach's $\alpha = .88$), whereby respondents rated 10 items conveying a strong expression of self-efficacy on a scale from *not at all true* (1) to *completely true* (4). To account for non-linearity in data, total scores were categorized into tertiles of low (range 10–28), moderate (range 29–31) and high (range 32–40) self-efficacy. The GSES has been shown to yield meaningful relationships with indicators of living well among individuals dealing with health stressors, although it may be less useful when related to more specific behaviors or outcomes (Luszczynska, Scholz & Schwarzer, 2005). Respondents also rated their agreement (5-point scale from 0 = *strongly*

disagree to 4 = *strongly agree*) with six statements from the Life Orientation Test-Revised (LOT-R; Scheier, Carver, & Bridges, 1994) to measure dispositional optimism. Negatively phrased items were reverse-coded and the sum of items taken to create total scores (Cronbach's $\alpha = .70$). These were again categorized into tertiles of low (range 0–14), moderate (range 15–16) and high (range 17–24) optimism. Lastly, the Rosenberg Self-Esteem (RSE) scale (Rosenberg, 1965) was utilized to measure overall feelings of self-worth or self-acceptance. The RSE is a self-report measure of global self-esteem consisting of 10 statements which participants rate their agreement with on a four-point scale ranging (1 = *strongly disagree* to 4 = *strongly agree*). Negatively phrased items were reverse coded to create total scores (Cronbach's $\alpha = .83$) which were then categorized as low (range 0–28), moderate (range 29–30) and high (range 31–40) self-esteem.

The GSES, LOT-R and RSE have not been previously validated for use with people with dementia, yet have shown strong psychometric properties across different age, gender and other social groups (e.g. Glaesmer et al., 2012; Luszczynska et al., 2005; Sinclair, Blais, Gansler, Sandberg, Bistis, & LoCicero 2010). As recorded, each has also shown acceptable Cronbach's alphas within the current study.

Measures of living well

To assess subjective appraisals of 'living well' three measures were used. The Quality of Life in Alzheimer's Disease (QoL-AD) Scale (Logsdon, Gibbons, McCurry, & Teri, 2000) is made up of 13 questions asking respondents to rate different aspects of their current situation as either *poor* (1), *fair* (2), *good* (3) or *excellent* (4). Higher total scores therefore indicate better QoL (range 13–52; Cronbach's $\alpha = .86$). The Satisfaction with Life Scale (SwLS; Diener, Emmons, Larsen, & Griffin, 1985) includes five items (rated on a 7-point scale from 1 = *strongly disagree* to 7 = *strongly agree*) about satisfaction with life past and desire to change one's life now. Higher total scores indicate greater life satisfaction (range 5–35; Cronbach's $\alpha = .82$). Finally, the World Health Organization-Five Well-being Index (WHO-5; World Health Organization, Regional office for Europe, 1998; Bech, 2004) was used to measure well-being. The measure includes five items reflecting on positive mood, feelings of vitality and being interested in things. These items are rated on a 6-point scale (from 0 = *at no time* to 5 = *all of the time*) to indicate the frequency that the respondent has felt these states. Once converted to percentage scores, a higher score out of 100 indicates greater well-being (Cronbach's $\alpha = .79$).

Additional information

Age, gender, dementia subtype, functional ability and cognitive functioning were measured. The Functional Activities Questionnaire (FAQ; Pfeffer, Kurosaki, Harrah, Chance, & Filos, 1982) was used, with the addition of 1-item in line with Martyr et al. (2012), to assess functional ability. Total scores range from 0 to 33 whereby higher scores show worse functional ability. Self-rated and informant-rated FAQ were separately tested within the fully-adjusted multivariate regression and a comparison made.

Conclusions when using the two did not differ and so self-rated FAQ was used to enable the use of the full sample. The Addenbrooke's Cognitive Examination-III (ACE-III; Hsieh, Schubert, Hoon, Mioshi, & Hodges, 2013) was used to assess cognitive functioning; this yields a total score out of 100 and higher scores indicate better cognitive function.

Analyses

Analyses used IDEAL baseline data version 2.0 and were conducted using Stata 14.2. Multivariate linear regression was used to examine the individual associations between psychological resources and living well measures adjusting for covariates (age group, sex, dementia subtype, FAQ and ACE-III). A full model including all three measures of psychological resources was then tested to examine whether each psychological resource remained an independent predictor of living well while accounting for any positive associations between the three measures of psychological resources. Previous guidance regarding the general population (Kobau, Snizek, Zack, Lucas, & Burns, 2010; Topp, Østergaard, Søndergaard, & Bech, 2015) and people with dementia (Clare, Woods, et al., 2014) would suggest that effect sizes can be judged as meaningful if QoL-AD and SwLS > 1.5 , and WHO-5 > 5.0 . Living well measures were further standardized to allow for comparison of effect sizes, examining whether the three psychological resources have a similar size effect on all three measures of living well. For some variables there was a high percentage of missing data (between 1.68% and 12.5% across all variables included) and overall 29.73% of participants had some missing data on the variables to be analysed. Therefore, assuming data was missing at random, 30 imputed data sets were generated using all variables in the modelling (due to missingness $> 10\%$; Jakobsen, Gluud, Wetterslev, & Winkel, 2017; Little & Rubin, 2002). The estimates from the

imputed datasets were combined using Rubin's rules (Rubin, 1996).

Results

IDEAL study participants were on average 76.37 years old ($SD = 8.56$) and 56.4% were male. A large proportion of the sample had a diagnosis of Alzheimer's disease (55.5%) or mixed dementia (Alzheimer's and vascular dementia; 21.1%). A mean ACE-III score of 69.28 ($SD = 13.19$) and a mean FAQ score of 9.59 ($SD = 7.69$) demonstrate marked cognitive and functional impairments (further descriptives in Table 1).

Univariable analyses

Unadjusted and partially adjusted (for age group, sex, dementia subtype) models are shown in Table 2. The fully adjusted univariable model (accounting for age group, sex, dementia subtype, FAQ and ACE-III) shows that high GSES (compared to low GSES) is associated with an additional 3.70 points on the QoL-AD (95% CI: 3.02, 4.38), 3.60 points on the SwLS (95% CI: 2.87, 4.33), and 13.36 points on the WHO-5 (95% CI: 10.98, 15.75). High RSE (compared to low RSE) is associated with an additional 5.14 points on the QoL-AD (95% CI: 4.47, 5.81), 4.57 points on the SwLS (95% CI: 3.84, 5.29), and 16.74 points on the WHO-5 (95% CI: 14.33, 19.15). High LOT-R (compared to low LOT-R) is associated with an additional 4.57 points on the QoL-AD (95% CI: 3.95, 5.19), 4.11 points on the SwLS (95% CI: 3.44, 4.79), and 13.96 points on the WHO-5 (95% CI: 11.75, 16.18).

Multivariable analyses

The effect sizes generally reduced in the full model compared to those in the univariable model. The fully adjusted

Table 1. Descriptive information about the participants.

	GSES	RSE	LOT-R
Overall mean (SD)	29.26 (5.49)	29.48 (3.79)	14.97 (3.50)
Low <i>N</i>	542 (35%)	505 (32.6%)	596 (38.5%)
Moderate <i>N</i>	407 (26.3%)	434 (28.1%)	348 (22.5%)
High <i>N</i>	465 (30.1%)	414 (26.8%)	490 (31.7%)
Missing <i>N</i>	133 (8.6%)	194 (12.5%)	113 (7.3%)
	QoL-AD	SwLS	WHO-5
Overall mean (SD)	36.78 (5.92)	26.07 (6.10)	60.94 (20.55)
	<i>N</i> (%)		
Age			
80+	603 (39%)		
75–79	370 (23.9%)		
70–74	260 (16.8%)		
65–69	178 (11.5%)		
<65	136 (8.8%)		
Sex			
Men	872 (56.4%)		
Women	675 (43.6%)		
Dementia subtypes			
Alzheimer's disease (AD)	858 (55.5%)		
Vascular dementia (VaD)	171 (11.1%)		
Mixed AD and VaD	326 (21.1%)		
Frontotemporal dementia	54 (3.5%)		
Parkinson's disease dementia	44 (2.8%)		
Dementia with Lewy bodies	53 (3.4%)		
Unspecified	41 (2.7%)		

Note: GSES, General Self-Efficacy Scale; RSE, Rosenberg Self-Esteem; LOT-R, Life Orientation Test-Revised; QoL-AD, Quality of Life in Alzheimer's disease scale; SwLS, Satisfaction with Life Scale; WHO-5, World Health Organization-Five Well-being Index.

Table 2. The association between psychological resources and measures of living well; multivariate univariable analyses, B Coef. (95% CI).

Model	1. QoL-AD			2. SwLS			3. WHO-5		
	GSES	RSE	LOT-R	GSES	RSE	LOT-R	GSES	RSE	LOT-R
a. Unadjusted									
Low (Ref)									
Moderate	2.88 (2.19, 3.58)	2.89 (2.15, 3.62)	10.40 (7.96, 13.66)	3.77 (3.11, 4.43)	3.34 (2.62, 4.05)	13.76 (11.42, 16.10)	3.06 (2.34, 3.77)	3.12 (2.35, 3.90)	9.58 (7.05, 12.11)
High	4.74 (4.07, 5.41)	4.23 (3.65, 4.96)	15.98 (13.66, 18.30)	6.01 (5.33, 6.68)	5.18 (4.46, 5.89)	19.34 (16.96, 21.72)	5.10 (4.46, 5.75)	4.48 (3.79, 5.17)	15.31 (13.03, 17.59)
b. Adjusted for age group, sex and dementia subtype									
Low (Ref)									
Moderate	2.78 (2.10, 3.48)	2.58 (1.85, 3.31)	9.87 (7.45, 12.29)	3.53 (2.88, 4.19)	3.01 (2.31, 4.01)	12.93 (10.61, 15.25)	2.89 (2.19, 3.59)	2.88 (2.13, 3.64)	8.98 (6.49, 11.47)
High	4.46 (3.80, 5.13)	3.77 (3.07, 4.47)	14.94 (12.62, 17.26)	5.69 (5.02, 6.36)	4.72 (4.01, 5.43)	17.96 (15.57, 20.35)	4.89 (4.26, 5.53)	4.19 (3.52, 4.87)	14.52 (12.28, 16.76)
c. Also adjusted for FAQ and ACE-III									
Low (Ref)									
Moderate	2.30 (1.62, 2.99)	2.47 (1.73, 3.21)	8.86 (6.43, 11.29)	3.10 (2.45, 3.74)	2.88 (2.16, 3.59)	11.84 (9.53, 14.16)	2.70 (2.02, 3.38)	2.85 (2.09, 3.61)	8.73 (6.30, 11.17)
High	3.70 (3.02, 4.38)	3.60 (2.87, 4.33)	13.36 (10.98, 15.75)	5.14 (4.47, 5.81)	4.57 (3.84, 5.29)	16.74 (14.33, 19.15)	4.57 (3.95, 5.19)	4.11 (3.44, 4.79)	13.96 (11.75, 16.18)

Note: CI, Confidence Interval; GSES, General Self-Efficacy Scale; RSE, Rosenberg Self-Esteem; LOT-R, Life Orientation Test-Revised; QoL-AD, Quality of Life in Alzheimer's disease scale; SwLS, Satisfaction with Life Scale; WHO-5, World Health Organization-Five Well-being Index.

multivariable model indicates that high GSES (compared to low GSES) is associated with an additional 2.03 points on the QoL-AD (95% CI: 1.37, 2.70), 2.14 points on the SwLS (95% CI: 1.41, 2.88), and 8.22 points on the WHO-5 (95% CI: 5.84, 10.60). High RSE (compared to low RSE) is associated with an additional 3.37 points on the QoL-AD (95% CI: 2.64, 4.10), 2.91 points on the SwLS (95% CI: 2.12, 3.70), and 11.14 points on the WHO-5 (95% CI: 8.52, 13.76). High LOT-R (compared to low LOT-R) is associated with an additional 2.84 points on the QoL-AD (95% CI: 2.18, 3.50), 2.52 points on the SwLS (95% CI: 1.78, 3.26), and 7.83 points on the WHO-5 (95% CI: 5.47, 10.19; Table 3).

When standardized, the multivariable model shows that high GSES (compared to low GSES) is associated with an additional .34 points on the QoL-AD (95% CI: .23, .46), .35 points on the SwLS (95% CI: .23, .47), and .40 points on the WHO-5 (95% CI: .28, .52). Similarly, optimism showed little variation based on the living well measure used. High LOT-R (compared to low LOT-R) is associated with an additional .48 points on the QoL-AD (95% CI: .37, .59), .41 points on the SwLS (95% CI: .29, .53), and .38 points on the WHO-5 (95% CI: .27, .50). Showing greater variation, high RSE (compared to low RSE) is associated with an additional .57 points on the QoL-AD (95% CI: .45, .69), .41 points on the SwLS (95% CI: .29, .53), and .54 points on the WHO-5 (95% CI: .41, .67; Table 4).

Discussion and implications

This study provides further evidence for the importance of positive psychological resources for living well with dementia. The study benefitted from use of a large community-based sample from across Great Britain, representing people with different dementia diagnoses and varying levels of functional and cognitive ability in the mild-to-moderate dementia range. Further, the study builds upon limited research to provide a greater understanding of the relationship between key psychological resources—self-efficacy, optimism and self-esteem—and capability to live well with dementia, as indexed by quality of life, life satisfaction and well-being.

Self-efficacy, optimism and self-esteem all predicted self-rated capability to live well for people with dementia, in line with research among other participant groups (e.g. Taylor, 1983; Teoh et al., 2009). After adjusting for age group, sex, dementia subtype, and functional and cognitive ability, differences in scores on the living well measures for those low and high in each psychological resource could still be considered clinically meaningful (Clare, Woods, et al., 2014; Kobau et al., 2010; Topp et al., 2015). This was also the case after accounting for shared variance between psychological resources. Comparing standardized scores for measures of living well reveals very little difference in the effect that each psychological resource has on the three separate measures of living well. A consistent positive association between psychological resources and measures of living well underlines the continued importance of psychological resources among those with mild-to-moderate dementia.

There was a notable reduction in the association between individual psychological resources and living well scores when shared variance between psychological

Table 3. The association between psychological resources and unstandardized measures of living well; multivariate multivariable analyses, B Coef. (95% CI).

Model	QoL-AD			SwLS			WHO-5		
	GSES	RSE	LOT-R	GSES	RSE	LOT-R	GSES	RSE	LOT-R
1. Unadjusted									
Low (Ref)	—	—	—	—	—	—	—	—	—
Moderate	1.71 (1.04, 2.37)	1.86 (1.14, 2.58)	6.57 (4.22, 8.91)	2.50 (1.84, 3.17)	2.13 (1.40, 2.86)	9.79 (7.44, 12.14)	2.00 (1.32, 2.68)	2.19 (1.42, 2.96)	5.76 (3.35, 8.18)
High	2.67 (2.10, 3.34)	2.49 (1.77, 3.20)	9.56 (7.21, 11.91)	3.86 (3.12, 4.60)	3.24 (2.45, 4.03)	12.79 (10.16, 15.42)	2.82 (2.14, 3.50)	2.49 (1.74, 3.24)	7.50 (5.09, 9.90)
2. Adjusted for age group, sex and dementia subtype									
Low (Ref)	—	—	—	—	—	—	—	—	—
Moderate	1.70 (1.04, 2.36)	1.66 (.94, 2.37)	6.37 (4.04, 8.70)	2.33 (1.68, 2.99)	1.92 (1.19, 2.64)	9.20 (6.87, 11.54)	1.96 (1.29, 2.62)	2.10 (1.35, 2.85)	5.63 (3.23, 8.02)
High	2.55 (1.90, 3.21)	2.17 (1.46, 2.88)	9.13 (6.79, 11.48)	3.65 (2.91, 4.38)	2.95 (2.16, 3.73)	11.76 (9.14, 14.38)	2.79 (2.13, 3.46)	2.46 (1.72, 3.20)	7.45 (5.08, 9.82)
3. Also adjusted for FAQ and ACE-III									
Low (Ref)	—	—	—	—	—	—	—	—	—
Moderate	1.38 (.72, 2.03)	1.64 (.92, 2.36)	5.80 (3.47, 8.13)	2.08 (1.43, 2.73)	1.87 (1.14, 2.59)	8.55 (6.23, 10.88)	1.96 (1.29, 2.61)	2.15 (1.40, 2.91)	5.90 (3.53, 8.27)
High	2.03 (1.37, 2.70)	2.14 (1.41, 2.88)	8.22 (5.84, 10.60)	3.37 (2.64, 4.10)	2.91 (2.12, 3.70)	11.14 (8.52, 13.76)	2.84 (2.18, 3.50)	2.52 (1.78, 3.26)	7.83 (5.47, 10.19)

Note: CI, Confidence Interval; GSES, General Self-Efficacy Scale; RSE, Rosenberg Self-Esteem; LOT-R, Life Orientation Test-Revised; QoL-AD, Quality of Life in Alzheimer's disease scale; SwLS, Satisfaction with Life Scale; WHO-5, World Health Organization-Five Well-being Index.

resources was taken into account. This shared variance between psychological resources demonstrates that someone high in optimism will also be more likely to be high in self-esteem and self-efficacy, consistent with the idea that some people are overall more 'resilient' (e.g. Connor & Davidson, 2003; Liu, Wang, Zhou, & Li, 2014). Despite this commonality between psychological resources, each individual resource represents a distinct construct that independently predicts scores on measures of living well. This is valuable when considering how positive psychological resources might be used to benefit people with dementia.

Future research and practice

These findings provide insight into possible ways of improving support for people living with dementia. In the absence of being able to remove the physical and cognitive impairments resulting from dementia, interventions might aim to bolster positive psychological resources and improve adaptation to adversity (e.g. Hindle et al., 2018; Quinn et al., 2016; Kinney & Rentz, 2005). The concepts of self-efficacy, optimism and self-esteem are much more clearly defined and amenable to intervention than global concepts like resilience. However, given the overlap shown between self-efficacy, optimism and self-esteem, it is likely that interventions targeting each of these three psychological resources will to some extent be mutually reinforcing.

Psychosocial interventions that increase self-efficacy and self-esteem among people with dementia have been evidenced (e.g. Hindle et al., 2018; Quinn et al., 2016; Kinney & Rentz, 2005), while interventions that increase optimism have only been explored among other patient groups (Meevissen, Peters, & Alberts, 2011). Bandura (1977) states that performance accomplishments, vicarious experiences, verbal persuasion and emotional arousal are sources of efficacy expectations. Interventions could therefore aim to alter these sources of self-efficacy. Additionally, while some interventions may seek to increase self-efficacy, optimism and/or self-esteem as a primary outcome, it would also be possible and perhaps more feasible to promote these factors within established interventions. For example, enabling and supporting participation in preferred activities pitched at the right level and providing a supportive environment may help to bolster all three psychological resources. Psychological resources can also be promoted within care settings by avoiding care models that promote dependence and instead focusing on supporting and enabling individuals to complete tasks that are still within their capabilities (Kitwood, 1997). Adjustments that enable continued participation in society, for example through improved public spaces, changes to the workplace and supported living, can also help to maintain psychological resources. Furthermore, there is a growing presence from people living with dementia who share their stories with others through different mediums. These individuals provide a balanced reflection on both their positive and negative experiences that may help others to reflect more optimistically (but also realistically) on their diagnosis (e.g. Mitchell, 2018; Oliver, 2016).

Table 4. The association between psychological resources and standardized measures of living well; multivariate multivariable analyses, B Coef. (95% CI).

Model	QoL-AD			SwLS			WHO-5		
	GSES	RSE	LOT-R	GSES	RSE	LOT-R	GSES	RSE	LOT-R
1. Unadjusted									
Low (Ref)									
Moderate	.29 (.17, .40)	.30 (.19, .42)	.32 (.20, .43)	.42 (.31, .53)	.35 (.23, .47)	.48 (.36, .59)	.33 (.22, .45)	.36 (.23, .48)	.28 (.16, .40)
High	.45 (.34, .56)	.41 (.29, .52)	.46 (.35, .58)	.65 (.53, .78)	.53 (.40, .66)	.62 (.49, .75)	.47 (.36, .59)	.41 (.28, .53)	.36 (.25, .48)
2. Adjusted for age group, sex and dementia subtype									
Low (Ref)									
Moderate	.29 (.18, .40)	.27 (.15, .39)	.31 (.20, .42)	.39 (.28, .50)	.31 (.20, .43)	.45 (.33, .56)	.33 (.22, .44)	.34 (.22, .47)	.27 (.16, .39)
High	.43 (.32, .54)	.36 (.24, .47)	.44 (.33, .56)	.61 (.49, .74)	.48 (.35, .61)	.57 (.44, .70)	.47 (.36, .58)	.40 (.28, .52)	.36 (.25, .48)
3. Also adjusted for FAQ and ACE-III									
Low (Ref)									
Moderate	.23 (.12, .34)	.27 (.15, .39)	.28 (.17, .40)	.35 (.24, .46)	.35 (.23, .48)	.42 (.30, .53)	.33 (.22, .44)	.35 (.23, .48)	.29 (.17, .40)
High	.34 (.23, .46)	.35 (.23, .47)	.40 (.28, .52)	.57 (.45, .69)	.41 (.29, .53)	.54 (.41, .67)	.48 (.37, .59)	.41 (.29, .53)	.38 (.27, .50)

Note: CI, Confidence Interval; GSES, General Self-Efficacy Scale; RSE, Rosenberg Self-Esteem; LOT-R, Life Orientation Test-Revised; QoL-AD, Quality of Life in Alzheimer's disease scale; SwLS, Satisfaction with Life Scale; WHO-5, World Health Organization-Five Well-being Index.

Limitations

The current analyses address the role of psychological resources among people living with dementia using cross-sectional data, and this limits the ability to make causal inferences. However, the IDEAL study is a longitudinal study therefore when data are available it will be possible to explore how these factors change over time. Further, despite the notably larger and clinically diverse (in terms of dementia subtype, cognitive and functional ability) sample than used in previous comparable research (e.g. Kitwood & Bredin, 1992; Moyle et al., 2007; Young et al., 2017), the current sample limited its intake to people with mild-to-moderate dementia at baseline. Findings should be more cautiously applied to those with severe dementia. However, Kitwood and Bredin (1992) advocate through their observational research that positive psychological resources are important throughout the course of dementia. Psychological resources should not be assumed to lack relevance among people with lower levels of cognitive functioning; instead the research of Kitwood and Bredin could be built upon by using a larger sample size and overcoming the practical difficulties of measuring complex psychological constructs through proxy and/or informant ratings. The measures of self-efficacy, optimism and self-esteem chosen for use in the current study, although showing strong validity across different social groups (e.g. Glaesmer et al., 2012; Luszczynska et al., 2005; Sinclair, Blais, Gansler, Sandberg, Bistis, & LoCicero 2010), have not been previously validated for use with people with dementia. The acceptable scale reliability of each within the current study however indicates their usefulness.

Using psychosocial interventions to increase self-efficacy, optimism and self-esteem among people living with dementia also poses some challenging questions. First, due to the cross-sectional nature of our analyses, it is not possible to say with certainty that the psychological resources of participants have changed over time and that they have the propensity to change in the future. Optimism in particular is discussed as a 'trait', 'disposition' or a dimension of 'personality' which may be largely stable over time, raising the question of whether interventions can create meaningful long-term change in optimism (Carver & Scheier, 2014). Longitudinal data could provide greater insight into this. However, evidence from previous intervention work supports the idea that they are amenable to change (e.g. Hindle et al., 2018; Quinn et al., 2016; Kinney & Rentz, 2005). Further, interventions should not ignore the progressive nature of dementia and should aim to help individuals find a helpful (rather than unrealistic) level of self-efficacy, optimism and self-esteem within a situation that is often not conducive to this experience (Taylor & Brown, 1988; Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzen, 1993). The development of relevant interventions would further test the malleability of these psychological resources, and whether and how they are best amenable to intervention among people with dementia.

Conclusion

This paper provides empirical evidence of a positive association between self-efficacy, optimism and self-esteem, and

capability to 'live well' among a large cohort of people with dementia. Whether in new or established interventions, these principles could be integrated and independent action, self-worth and positive thinking strengthened among people with dementia.

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Conflicts of interest

No potential conflict of interest was reported by the authors.









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Author contributions

RAL is responsible for the data analysis and interpretation, and drafting the article. SMN, CQ, AM, MDK, JVH, RWJ and LC were involved in the original conception and design of the IDEAL study. All authors contributed to the critical revision of the article, and approved the version to be published.

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Data availability

The IDEAL data will be deposited with the UK Data Archive upon completion of the study in March 2020. Details on how the data can be accessed after this date will be made available on the project website www.idealproject.org.uk.

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